

# *Fasciculochloa*, a new grass genus (Poaceae: Paniceae) from south-eastern Queensland

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## Summary

Simon, Bryan K. & Weiller, Carolyn M. (1995). *Fasciculochloa*, a new grass genus (Poaceae: Paniceae) from south-eastern Queensland. *Austrobaileya* 4(3): 369–379. A new panicoid genus, *Fasciculochloa*, with a single species *Fasciculochloa sparshottiorum*, from the Moreton District of south-eastern Queensland is described and illustrated.

Keywords: Poaceae: Paniceae, *Fasciculochloa sparshottiorum*, *Fasciculochloa* - south-eastern Queensland.

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## Introduction

In 1993, Kym Sparshott of the Queensland Herbarium was requested to produce an environmental impact assessment on the Hancock Brothers' pine plantation, in the Logan Shire, south of Brisbane, prior to the re-assignment of this area to urban development at the culmination of its present use as an area for growing commercial timber. Among the collections of botanical specimens made by Kym and Peter Sparshott for the compilation of a plant inventory of the region, was an unusual grass allied to *Panicum* L. I (BKS) was unable to identify it and failed to key it to a recognisable genus in both the computerised INTKEY set of generic descriptions of the grass genera of the world by Watson and Dallwitz (1992–5) and in the key to genera by Clayton and Renvoize (1986). We are therefore describing this taxon as *Fasciculochloa*, a new genus in the Paniceae.

Using INTKEY this grass keys to *Loudetia*, but it differs from that genus by its glumes not being awned. It keys to couplet 81 in the key to genera of the Paniceae by Clayton and Renvoize (1986), leading to the genera *Arthropogon* Nees and *Reynaudia* Kunth; it differs from the former by its lower glume not being awn-like and from the latter by its lower

glume not being bilobed. It keys to couplet 25 in the key to genera of Australian Paniceae by Webster (1987), leading to the genera *Rhynchelytrum* Nees and *Melinis* P.Beauv. (the former now included in *Melinis*), but differs by the upper glume being 3–5-nerved as opposed to 5–7-nerved in the latter genera, and by its fasciculate mature panicle branches. It keys to *Cliffordiochloa* B.K.Simon in Simon (1993).

*Fasciculochloa* is similar to *Alexfloydia* B.K.Simon, *Cliffordiochloa* B.K.Simon and *Dallwatsonia* B.K.Simon, three Australian panicoid genera recently described (Simon 1992) in that its spikelets are laterally compressed to terete and the lower glume is adaxial to the adjacent pedicel or inflorescence axis. In all four genera this feature is only clearly seen where the spikelets have short pedicels. The lower glume may sometimes appear to be abaxial in spikelets with longer pedicels due to twisting of the pedicels.

Morphological and anatomical characters of *Fasciculochloa* were coded using the Watson and Dallwitz DELTA character list (Watson & Dallwitz 1994) and the DIFFERENCES option of INTKEY was run to assess how this genus differed from *Alexfloydia*, *Cliffordiochloa*, *Dallwatsonia* and *Panicum*. In all the analysis revealed 75 character differences of which the 20 most obvious ones are shown in **Table 1**. The characters and character states of these 20 characters are shown in **Table 2**.

**Table 1.** The main 20 characters distinguishing *Fasciculochloa* from related genera.

Char	<i>Alexfloydia</i>	<i>Cliffordiochloa</i>	<i>Dallwatsonia</i>	<i>Fasciculochloa</i>	<i>Panicum</i>
89	1	1	1	2	1/2
125	3–3.5	1.5	3.5–4	2.5	1.4–6
128	2	2	2	2	1
129	1	1	1/2	1/2	3
165	2	2	1	1	1/2
170	5–7	1	5	3	1–7
172	9	2–5	5–7	3–5	3–9
182	1	1	2	1	1/2
183	2	2	2	1	2
184	1	2	2	2	1/2
187	9	3–5	5	5	5
230	5	0	5–7	2	3–11
253	3	2	3	2	3
301	2	2	2	1	1
323	2	1	1	2	1/2
331	1	1	1	2	1
336	C <sub>4</sub>	C <sub>3</sub>	C <sub>3</sub>	C <sub>3</sub>	C <sub>3</sub> /C <sub>4</sub>
360	1	1	1	2	1/2
362	1	2	1	2	1/2
364	2	1	1	1	1

Morphologically *Fasciculochloa* differs from *Cliffordiochloa* by the fasciculate nature of its spikelets at the apex of mature panicle branches, the branches being bare of spikelets at the base, by the lower glume being 3-nerved (1-nerved in *Cliffordiochloa*) and less than half the length of the lowest lemma (longer than half the length of the lowest lemma in *Cliffordiochloa*) and by its larger spikelets (c.2.5 mm long compared to c.1.5 mm long in *Cliffordiochloa*). It shares with *Cliffordiochloa* the characters of the sterile lower floret with a fully developed palea and the fertile floret with two stamens, a feature known only in one other panicoid

genus, *Reynaudia* Kunth from Cuba (Watson & Dallwitz 1992). It differs from *Dallwatsonia* by the fasciculate nature of its spikelets at the apex of mature panicle branches, the branches bare of spikelets at the base, its smaller spikelets (c. 2.5 mm long compared to 3.5–4 mm long in *Dallwatsonia*), its 3-nerved lower glume (5-nerved in *Dallwatsonia*), its 3-5-nerved upper glume (5–7-nerved in *Dallwatsonia*), its palea of the lower floret being fully developed and becoming conspicuously hardened (reduced and not hardened in *Dallwatsonia*) and its fertile floret having two stamens (three in *Dallwatsonia*). *Fasciculochloa*

**Table 2. Characters and character states of the 20 characters used in Table 1, extracted from the DELTA chars file of Watson and Dallwitz (1992–5)**

- #89. racemes <whether spikelet bearing to the base>/  
 1. spikelet bearing to the base/  
 2. without spikelets towards the base/
- #125. <female-fertile> spikelets <approximate length>/  
 mm long/
- #128. <female-fertile> spikelets <orientaion of sessile to subsessile forms>/  
 1. abaxial <G1 when present on the side away from the rachis; in panicoid forms having a proximal incomplete floret, the upper (female-fertile) lemma backs onto the rachis>/  
 2. adaxial <G1 when present against the rachis; in panicoid forms having a proximal incomplete floret, the upper (female-fertile) lemma is on the side away from the rachis>/
- #129. <female-fertile> spikelets <plane of compression>/  
 1. compressed laterally <lying on the side when placed on a flat surface>/  
 2. not noticeably compressed <terete>/  
 3. compressed dorsiventrally <lying on front or back when placed on a flat surface>/
- #165. lower glume <length relative to the lowest lemma>/  
 1. much shorter than half length of lowest lemma/  
 2. longer than half length of lowest lemma/
- #170. lower glume <of female-fertile spikelet, nerve number>/  
 nerved/
- #172. upper glume <of female-fertile spikelets, nerve number>/  
 nerved/
- #182. palea of proximal incomplete florets <development>/  
 1. fully developed/  
 2. reduced/
- #183. palea of proximal incomplete florets <whether hardened>/  
 1. becoming conspicuously hardened/  
 2. not becoming conspicuously hardened/
- #184. proximal incomplete florets <of the female-fertile spikelets: sexuality>/  
 1. male/  
 2. sterile/
- #187. proximal lemmas <of the female-fertile spikelets, nerve number>/  
 nerved/
- #230. <female-fertile> lemmas <number of nerves>/  
 nerved/
- #253. stamens <number per female-fertile floret>/

- #301. long-cells <of abaxial leaf blade epidermis, whether similar in shape costally and intercostally>/  
 1. similar in shape costally and intercostally/  
 2. markedly different in shape costally and intercostally/
- #323. intercostal short-cells <abaxial leaf blade, presence>/  
 1. common/  
 2. absent or very rare/
- #331. costal silica bodies <of abaxial leaf blade epidermis, presence>/  
 1. present and well developed/  
 2. poorly developed/  
 3. absent/
- #336. <maximum cells-distant count; indicating photosynthetic pathway>/  
 1. <showing a maximum cells-distant count of one, reliably predicting> C<sub>4</sub>/  
 2. <showing a maximum cells-distant count of two or more, reliably predicting> C<sub>3</sub>/
- #360. midrib <of the leaf blade, prominence>/  
 1. conspicuous <prominent in the outline>/  
 2. not readily distinguishable <other than by position>/
- #362. midrib <whether extensively of colourless cells adaxially>/  
 1. with conspicuous colourless tissue adaxially/  
 2. without <conspicuous> colourless tissue adaxially/
- #364. bulliforms <presence in the adaxial leaf blade of discrete adaxial groups: exclude ‘hinge’ groups flanking midribs>/  
 1. present in discrete, regular adaxial groups/  
 2. not in discrete, regular adaxial groups <bulliform cells absent or in ill defined or irregular groups, or constituting most of the epidermis>/

shares with *Dallwatsonia* the characters of the lower glume being much shorter than half the length of the lower lemma, the lower floret being sterile and the 5-nerved lower lemma. It differs from *Alexfloydia* by its smaller spikelets (c.2.5 mm long compared to 3–3.5 mm long in *Alexfloydia*), by its 3-nerved lower glume less than half the length of the lower lemma (5–7-nerved lower glume longer than half the length of the lower lemma in *Alexfloydia*), its lower floret being sterile (male in *Alexfloydia*), its 5-nerved lower lemma (9-nerved in *Alexfloydia*) and the two stamens in the fertile floret (three stamens in *Alexfloydia*).

From the use of the DIFFERENCES option of DELTA, it is obvious there are 7 anatomical differences by which *Fasciculochloa* can be distinguished from allied Australian panicoid genera. The abaxial leaf-blade epidermis has long-cells that are costally and intercostally similar in shape in *Fasciculochloa*, but markedly different in *Alexfloydia*,

*Cliffordiochloa* and *Dallwatsonia*, intercostal short-cells are infrequent in *Fasciculochloa* and *Alexfloydia*, but common in *Cliffordiochloa* and *Dallwatsonia* and costal silica bodies are poorly developed in *Fasciculochloa* but well developed in the other three genera. *Fasciculochloa*, *Cliffordiochloa* and *Dallwatsonia* have C<sub>3</sub> leaf anatomy in that the maximum cells-distant count between vascular bundles is two or more whereas *Alexfloydia* has C<sub>4</sub> leaf anatomy in that the maximum cells-distant count between vascular bundles is one. The leaf-blade midrib is not readily distinguishable in *Fasciculochloa* but conspicuous in the other genera and the midrib is without colourless tissue adaxially in *Fasciculochloa* and *Cliffordiochloa* but with conspicuous colourless tissue adaxially in *Alexfloydia* and *Dallwatsonia*. Bulliform cells are not in discrete regular adaxial groups in *Fasciculochloa*, *Dallwatsonia* and *Cliffordiochloa*, as they are in *Alexfloydia*.



**Fig.1.** *Fasciculochloa sparshottorum*: A<sub>1</sub> and A<sub>2</sub>, habit  $\times 0.5$ . B. leaf sheath junction with leaf blade, adaxial surface  $\times 10$ . C. apex of inflorescence branch  $\times 5$ . D. spikelet, lateral view  $\times 20$ . E. lower glume. F. upper glume. G. lower lemma. H. lower palea. I. upper lemma. J. upper palea (D-J, all adaxial views,  $\times 10$ ). K. caryopsis, viewed from embryo side. L. caryopsis, viewed from hilum side (K-L,  $\times 10$ ). M. stamens, pistils and lodicules  $\times 40$ . All drawn from holotype.

**Fasciculochloa** B.K.Simon & C.M.Weiller, **gen.nov.**, *Cliffordiochloae* B.K.Simon affine sed ramis paniculae matura spiculis fasciculis ad apicem, basi nudis, spiculis grandioribus, glumis inferis 3-nervatis, *Dallwatsoniae* B.K.Simon affine sed ramis paniculae matura spiculis fasciculis ad apicem, basi nudis, glumis inferis 3-nervatis, flosculis fertilibus staminibus duobus (non tribus), *Alexfloydiae* B.K.Simon affine sed spiculis parvioribus, glumis inferis 3-nervatis, glumis superis 5-nervatis, flosculis inferis sterilibus, flosculis fertilibus staminibus duobus (non tribus), *Melinis* P.Beauv. affine sed ramis paniculae matura spiculis fasciculis ad apicem, glumis superis 3–5-nervatis, differt. **Typus.** *Fasciculochloa sparshottiorum* B.K.Simon & C.M.Weiller.

Flowering culms erect, tufted, sparingly branched, terminated by a solitary inflorescence, 3 or 4 noded. Internodes slightly longer than the associated leaf sheaths. Leaf sheaths compressed, glabrous, with smooth nerves. Ligule a fringed membrane. Mid-culm leaf blades flat, linear, glabrous except for cilia at base, smooth, tapering to a narrow apex, attenuate at the base, with imperceptibly scaberulous margins. Inflorescence a panicle, fully exerted at maturity. Main axis scaberulous. Primary branches with glabrous axils, spreading, angled, scaberulous, terminating in a spikelet. Pedicels flexuous with apices glabrous and cupuliform. Disarticulation at the base of the spikelet. Spikelets ± distal on branches, obscurely adaxial (with the lower glume facing the adjacent pedicel or inflorescence axis), overlapping, single or sometimes obscurely paired, ± terete to laterally compressed, oblong. Glumes unequal, membranous, smooth, glabrous: lower glume oblong, encircling the spikelet base, 3-nerved, acute or rounded at apex; upper glume elliptic, 3–5-nerved, rounded on the back, acute. Lower floret neuter: lemma ovate-elliptic, membranous, 5-nerved, with nerves smooth and conspicuous, glabrous, acute; palea ovate-elliptic, acute. Upper floret perfect, slightly shorter than the lower floret; lemma chartaceous, elliptic, rounded on the back, obscurely nerved, glabrous, acute; palea chartaceous, smooth, enclosed at its apex by the lemma. Lodicules well-developed. Stamens 2, styles basally free.

**Etymology:** The genus name is derived from the fasciculate appearance of the spikelets on the branches of the mature panicle.

**Fasciculochloa sparshottiorum** B.K. Simon & C.M. Weiller, **sp. nov.** Culmus florens erectus, caespitosus, ad 60 cm altus, parce ramosus, terminatus inflorescentia solitaria, 3- vel 4- nodosus; nodi glabri; internodia spongiosi, glabra, leviter longiora quam vaginas contiguas; vaginae complanatae, glabrae, marginibus laevibus, nervis laevibus; ligula membranae fimbriatae, ad 0.4 mm longa; laminae lineares, ad 20 cm longae et ad 3.5 mm latae, contractae ad apices, attenuati ad bases, planae, glabrae praeter ciliatae ad bases, laeves, marginibus scaberulis. Panicula matura exserta; axis principalis ad 15 cm longus, dilute scaberulus; rami primarii cum axillis glabris, effusi, ad 5 cm longi, angulati, scaberuli, in spiculam terminantes. Pedicelli ad 1 mm longi, flexuosi, apicibus glabris, articulo ad basem spiculae. Spiculae abaxiales, imbricatae, in ramum primarium ad apicem dispositae, oblongae, teretes, ad 2.5 mm longae, ad 1 mm latae; gluma infera oblonga, ad 1 mm longa, 3-nervata, membranacea, laevis, glabra, acuta vel rotundata ad apicem, basem spiculae cingens; gluma supera elliptica, ad 1.7 mm longa, 3–5-nervata, rotundata in dorsum, membranacea, glabra praeter cilia in marginibus, acuta. Flosculus inferus neuter; lemma ovatum vel ellipticum, ad 2.5 mm longum ad 0.5 mm latum, acutum. Flosculus superus bisexualis, leviter brevior quam flosculus inferum; lemma ellipticum, ad 2.2 mm longum, obscure nervatum, rotundatum in dorsum, chartaceum, aequae striatum, glabrum, glabrum, acutum; palea obscure nervata, chartacea, laevis, apex lemmate inclusus; lodiculae bene evolutae; anthera ad 0.75 mm longa; styli liberi ad bases. **Typus:** Queensland, MORETON DISTRICT, Hancock Brother's Pine Plantation, 9 km SSE of Logan Village, 27°51'S 153°08'E, 27 Jan 1994, B.K. Simon 4270, E.J. Thompson, P. & K. Sparshott & D.A. Simon, drainage line dominated by *Melaleuca linariifolia* low woodland, growing with *Pseudoraphis paradoxa*

in wetter zones, delicate perennial, locally common. (holo: BRI (AQ632530 – 2 sheets); iso: AD,B,BRI,CANB, DNA, IBSC, K,L,MEL,MO,NSW,PERTH, PRE,SRGH,US). **Fig. 1.**

A full English species description is not provided as the essential descriptive elements can be found in the English generic description. The following English diagnosis supplies characters of a specific nature, including mainly quantitative measurements, which can be used to compare any further species that may be discovered.

Flowering culms erect to 60 cm tall. Nodes glabrous. Internodes spongy, glabrous. Ligule to 0.4 mm long. Mid-culm leaf blades to 20 mm long, to 3.5 mm wide. Inflorescence with main axis to 15 mm long, faintly scaberulous. Primary branches to 5 mm long. Pedicels to 1 mm long, flexuous. Spikelets 35 to 45 on a typical lowermost primary branch, to 2.5 mm long, to 1 mm wide. Lower glume to 1 mm long. Upper glume to 1.7 mm long. Lower lemma to 2.5 mm long, 0.5 mm wide. Lower palea fully

developed, ovate-elliptic, acute. Upper lemma to 2.2 mm long. Anthers to 0.75 mm long.

**Etymology:** The species is named for Kym and Peter Sparshott, the original collectors of the species.

**Specimens examined:** Queensland. MORETON DISTRICT: Hancock Brothers' Pine Plantation, B.K. Simon 4270, E.J. Thompson, P. & K. Sparshott & D.A. Simon (type - for details see above); Hancock Brothers' Pine Plantation, 27°49'03"S 153°07'30"E, associated with *Melaleuca linariifolia*, *Ludwigia* sp., *Juncus usitatus*, *Persicaria* sp., *Imperata cylindrica* and *Ischaemum australe*. Waterlogged area, plants in water, rooting at nodes, K. Sparshott 252 & P. Sparshott (BRI, CANB, NSW, SP).

**Distribution and habitat:** Very restricted site in south-eastern Queensland, 9 km SSE of Logan village. Flowering Jan-Feb. Associated in marshy area dominated by *Melaleuca linariifolia*. **Fig 2.**

**Rare and threatened status** (Briggs & Leigh 1988). 2E. Under the Queensland Nature Conservation Act (1992) we recommend that this taxon be considered endangered.



**Fig.2.** Type locality of *Fasciculochloa sparshottiorum* growing in marshy area dominated by *Melaleuca linariifolia*.

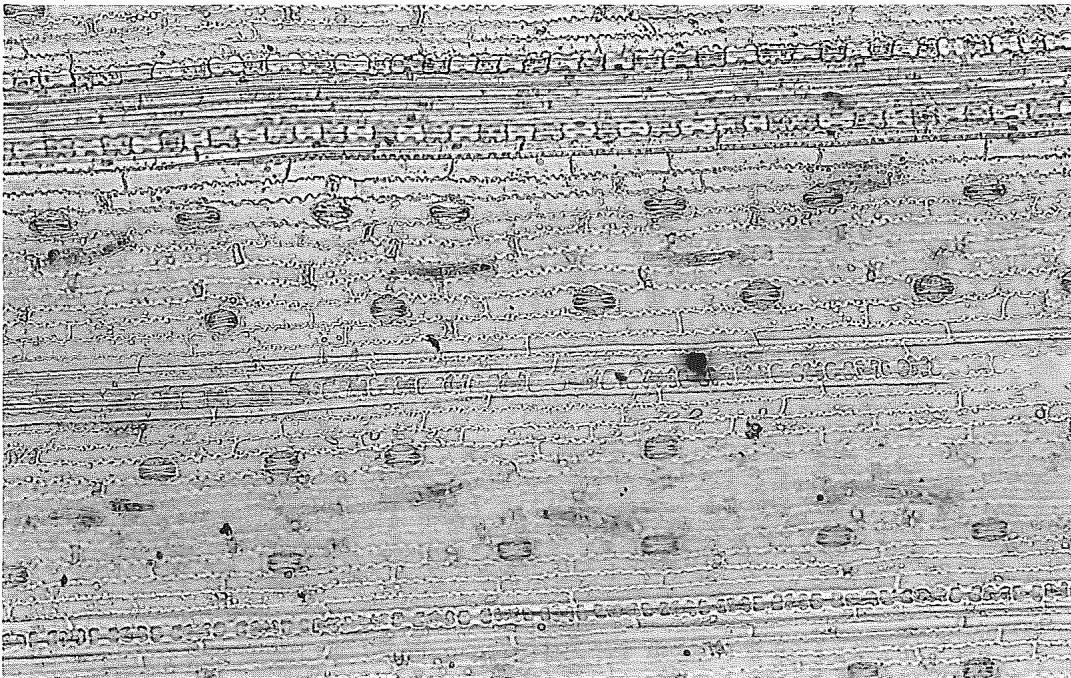
**Anatomy** (by C.M.Weiller)

**Abaxial leaf blade epidermis.** *Costal/intercostal zonation* conspicuous, intercostal zones bordering the midrib 10–12 cells wide. Epidermis with differentiated long- and short-cells, long-cells similar in shape costally and intercostally, of similar wall thickness costally and intercostally. *Microhairs* present, confined to the non-stomatal files, in the middle of the intercostal zone, panicoid-type, elongated, longer than the stomatal complexes, clearly two-celled, slender, having both cells approximately the same shape. Distal cell blunt. Basal cell base neither constricted nor expanded, parallel-sided. Microhairs 51–69  $\mu\text{m}$  long, 6  $\mu\text{m}$  wide at the septum. Microhair apical cells 27–30  $\mu\text{m}$  long. Crown cells absent. Prickles present, intercostal, fairly uniform in size and form. Prickle bases not paired with a short-cell. Intercostal prickles in the stomatal files (in between the stomatal files), infrequent. Intercostal prickles 4–6 per field. Bases of the intercostal prickles shorter than the width of an intercostal long-cell to about as long as the width of an intercostal long-cell, shorter than the stomata. Barbs of the intercostal prickles about as long as the bases to up to twice as

long as the bases. Macrohairs absent. Intercostal long-cells fairly constant in shape. Mid intercostal long-cells markedly elongated, rectangular. Mid-intercostal long-cell walls moderately undulating. Undulations irregular. End walls vertical, or angled. Intercostal long-cell walls not conspicuously pitted. Outer surfaces of intercostal long-cells not pitted. Papillae absent.

*Costal zones* all histologically similar. Costal short-cells conspicuously in long rows. Costal cork-cells similar in shape to the silica cells, square to elongated-rectangular (ignoring cell wall undulations). Costal silica bodies present and conspicuous, confined to the outer edges of costal zones or confined to the central files of the costal zones (in narrow costal zones), with horizontal dumb-bells having flattened or indented ends. Isthmuses of the dumb-bells about as long as the expanded ends, wide.

*Intercostal short-cells* infrequent, throughout the intercostal zones (but of a slightly higher frequency between stomatal files), solitary. Unsilicified intercostal short-cells tall-and-narrow. Walls straight. Intercostal silica bodies absent.



**Fig. 3.** *Fasciculochloa sparshottorum*, abaxial leaf epidermis.



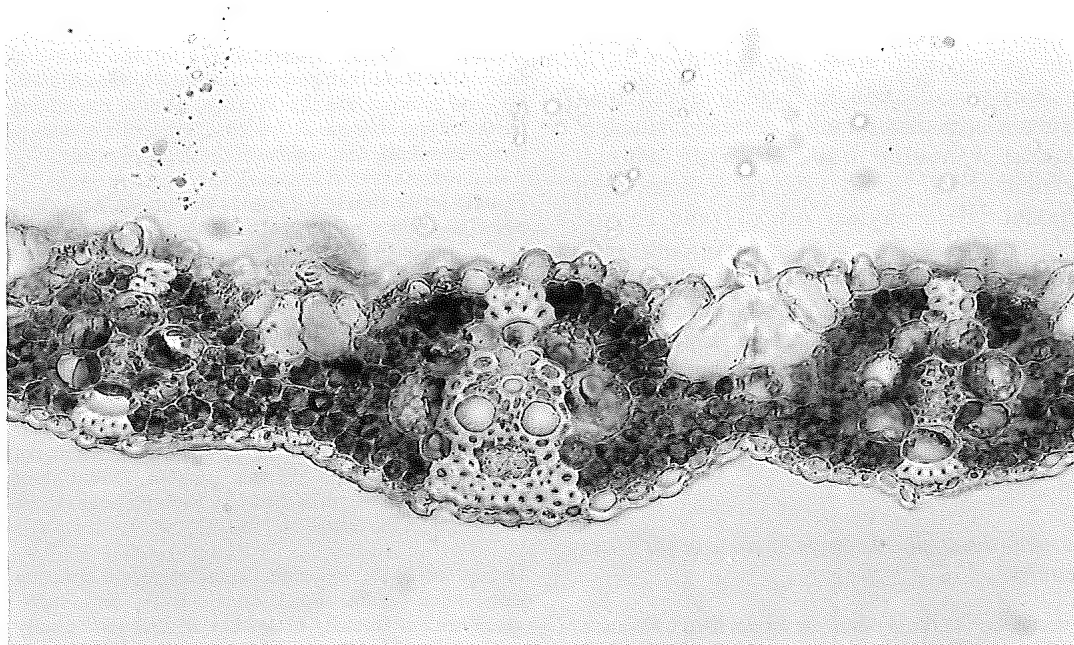


Fig. 4. *Fasciculochloa sparshottiorum*, transverse section of leaf blade. C<sub>3</sub>, XyMS+.

*Stomata* common, present in all the intercostal zones, restricted in distribution within intercostal zones (in 2 files), arranged in definite rows. Stomatal rows in the widest intercostal zones 2, bordering the costae (but 2–3 cell files away). Stomata not over-arched by papillae, 18–27  $\mu\text{m}$  long, having guard-cells flush with or overlapping the interstomata. Subsidiaries dome-shaped. **Fig. 3.**

**Photosynthetic pathway and related features.** C<sub>3</sub>, XyMS+. PBS sheaths of the primary lateral vascular bundles interrupted. Mestome sheath single.

**Transverse section of the leaf blade.** Lamina mid-zone in transverse section open, more or less flat. Width of lamina across primary ribs 84–90  $\mu\text{m}$ . Lamina mid-zone in transverse section with shallow ribs both adaxially and abaxially, opposite one another. Adaxial furrows slight, narrow. Wavelength 120–135  $\mu\text{m}$ . Amplitude 12–15  $\mu\text{m}$ . Adaxial furrows between all the vascular bundles (except for the smallest bundles). Adaxial ribs more or less constant in size, round topped to flat-topped, opposite all vascular bundles. Vascular bundles in the mid-lamina 3–4, 1 per rib. Abaxial

furrows present between the vascular bundles. Abaxial ribs opposite all the vascular bundles, similar in size to the adaxial ribs. Midrib not pronounced in outline, not prominent adaxially or abaxially, tissue layout similar to that of other primary vascular bundles. Vascular bundles in the mid-lamina region of the midrib 1. Median vascular bundle without a protoxylem cavity, without an enlarged protoxylem vessel, without sclerosed phloem. Midrib without colourless tissue adaxially, without thin-walled sclerenchymatous cells adaxially, without lacunae. Lamina symmetrical on either side of the midrib.

Mesophyll chlorenchyma non-radiate, not of the *Isachne*-type (Plate 3:26 in Watson & Dallwitz 1988), tightly packed, without lacunae, without any obvious adaxial palisade, not traversed by columns of colourless cells, without arm cells, without fusoids. Bulliforms present in discrete groups. Bulliform groups situated between vascular bundles, without contiguous colourless mesophyll cells, large, simple, fan-shaped (with 2 large middle cells). Abaxial epidermis without bulliform-like epidermal cells or groups. Abaxial epidermal

cell walls thickened. Cells regular in shape, ovoid, or rectangular. Major vascular bundles interspersed with minor bundles. Outlines of primary vascular bundles more or less circular. Primary vascular bundles centrally situated, lateral vascular bundles with adaxial sclerenchyma, lateral vascular bundles with abaxial sclerenchyma. Adaxial and abaxial sclerenchyma forming girders, combined girders nowhere forming 'figures' (Plate 3:24 in Watson & Dallwitz 1988). Outlines of lower order vascular bundles more or less circular. Lower order vascular bundles centrally situated, with adaxial and abaxial sclerenchyma forming girders. Combined girders of the lower order vascular bundles nowhere forming 'figures'. **Fig. 4.**

#### **Generic description comparative to other grass genera.**

A description of the genus in the format used by Watson and Dallwitz (1994) was generated with the TONAT option of DELTA, so that a comparative description to all other grass genera contained in that publication is available. The reader is referred to the character list (p. 9–49) for clarification/interpretation/definition of terms and references to character illustrations.

**Fasciculochloa** B.K.Simon & C.M.Weiller

**Habit, vegetative morphology.** Perennial; caespitose. Culms to 60 cm high; herbaceous; branched above (sparingly); not tuberous; 3–4-noded. Culm nodes glabrous. Upper culm leaf blades fully developed. Culm internodes solid. Young shoots intravaginal. Leaves not basally aggregated, clearly differentiated into sheath and blade. Leaf blades linear, narrow, to 3.5 mm wide; flat, parallel veined, persistent. Ligule a fringed membrane, to 0.4 mm long.

**Reproductive organisation.** Plants bisexual, with bisexual spikelets, with hermaphrodite florets.

**Inflorescence.** Inflorescence paniculate, open, with axes ending in spikelets, espatheate, not comprising 'partial inflorescences' and foliar organs. Spikelets solitary, or paired (obscurely), not secund, pedicellate. Pedicel apices cupuliform.

**Female-fertile spikelets.** Spikelets to 2.5 mm long, elliptic, adaxial (obscurely), terete to laterally compressed, falling with the glumes. Rachilla hairless.

**Glumes** two, very unequal, the upper slightly shorter than the spikelet, the lower about half as long; shorter than the adjacent lemmas, glabrous, awnless, non-carinate. Lower glume 0.6 times the length of the upper glume, shorter than the lowest lemma, 3-nerved. Upper glume 3–5 nerved.

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Spikelets with incomplete florets, the incomplete florets proximal to the female-fertile florets. Proximal incomplete florets 1, paleate, sterile. Palea of the proximal incomplete florets becoming conspicuously hardened (leathery) and enlarged laterally. Proximal lemmas resembling the upper glume, awnless, 5-nerved, similar in texture to the female-fertile lemmas, not becoming indurated.

**Female-fertile florets** 1. Lemmas elliptic, similar in texture to the glumes, smooth, not becoming indurated, entire; blunt, awnless; having the margins lying flat and exposed on the palea, 2 nerved. Palea tightly clasped by the lemma, entire, awnless, textured like the lemma. Palea back glabrous. Lodicules 2, joined at base, glabrous, not toothed. Stamens 2. Anthers to 0.75 mm long. Ovary glabrous. Styles free to their bases. Stigmas 2.

**Fruit, embryo and seedling.** Disseminule a free caryopsis. Fruit free from both lemma and palea, small, ellipsoid, not noticeably compressed, glabrous, smooth. Hilum short (about 5% of the length of the fruit). Embryo large (about 30% length of the fruit).

**Abaxial leaf blade epidermis.** Costal/intercostal zonation conspicuous. Papillae absent. Long-cells similar in shape costally and intercostally, of similar wall thickness costally and intercostally. Microhairs present, elongated, clearly two-celled, panicoid-type, 51–69  $\mu\text{m}$  long, 6  $\mu\text{m}$  wide at the septum. Microhair apical cells 27–30  $\mu\text{m}$  long. Stomata common, 18–27  $\mu\text{m}$  long. Subsidiaries non-papillae, dome-shaped. Guard-cells overlapped by the interstomata, or overlapping to flush with the interstomata. Intercostal short-cells absent or very rare, silicified. Intercostal silica bodies crescentic. Intercostal prickles present, fairly uniform in size. Crown cells absent. Costal zones with short-cells. Costal short-cells conspicuously in long rows. Costal silica bodies poorly developed, 'panicoid-type', dumb-bell shaped.

**Transverse section of leaf blade, physiology, culm anatomy.**  $C_3$ ; XyMS+. Midrib not readily distinguishable. Bulliforms present in discrete, regular adaxial groups, in simple fans.

**Taxonomy.** Panicoideae; Panicoideae; Paniceae.

**Ecology, geography, regional floristic distribution.** 1 species. Helophytic to mesophytic. South-eastern Queensland.

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